

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

**In the application of** : Roberts, Timothy  
**Serial No.** : 10/720,856  
**Filed** : November 24, 2003  
**For** : Customer Billing in a Communications Network  
**Examiner** : Olabode Akintola  
**Art Unit** : 3691  
**Customer number** : 23644  
**Attorney Docket No.** : 920476-95165

**DECLARATION OF TIMOTHY ROBERTS UNDER 37 C.F.R. §1.131**

I, Timothy Roberts, declare as follows:

1. I am the inventor of the subject matter of this application, which has been assigned to my employer, Nortel Networks Limited of St. Laurent, Quebec, Canada.

2. This application is a continuation-in-part of my prior US Patent Application Serial No. 10/185,134, filed June 28, 2002, which is abandoned, which itself was the regular filing of provisional US Patent Application No. 60/355,221, which was filed on February 8, 2002.

3. The Examiner has cited Nauer published US Application US 2002/0161601 A1 as a primary reference. While Nauer was published on October 31, 2002, I have been informed that the effective date of Nauer as a reference is the filing date of Nauer on January 30, 2002.

4. My invention of the present application was made prior to January 30, 2002 and, in fact, was made in 2001. Attached as Exhibits A, B and C are documents prepared in the late 2001 reflecting the invention of the present application. To establish dates for those documents, attached as Exhibit D is a screen shot of my directory of the files, and the dates of Exhibits A, B and C are emphasized on Exhibit D

in order by the encircled numbers 1, 2 and 3. That is, Exhibit A is dated November 21, 2001, Exhibit B is dated November 30, 2001, and Exhibit C is dated December 5, 2001.

5. Exhibit A is my first attempt to set forth the invention in a discernible manner. Exhibit B was a working document that I prepared. The last chart included arrows, etc. to build call flows, the graphics being pasted into various documents. Exhibit C was a status update to the management of Nortel (commenced in November 2001) and is what led to the ultimate patent filing on February 8, 2002 after the Christmas break at the end of 2001.

6. In early 2002, I was focused on a presentation of the invention in May 2002, and attached as Exhibit E is an e-mail of January 11, 2002 in which a presentation for that conference, of the IEEE, was presented. I presented an invention disclosure for my invention to Nortel on February 7, 2002, which is Exhibit F hereto. Provisional US Patent Application 60/355,221 was then filed on February 8, 2002.

7. I also maintained log books during this time period. Attached as Exhibit G is one group of pages, beginning October 25, 2001, and continuing through December 6, 2001 having notes regarding the invention and comprising selected pages from one notebook. Attached as Exhibit H are entries of my second log book, beginning January 15, 2002 and continuing through February 14, 2002.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

Dated: 28<sup>th</sup> February 2009

  
TIMOTHY ROBERTS

# **EXHIBIT A**

# Customer Requirements

- **Increasing need for real-time credit control**
  - M-commerce increases potential credit risks
  - Pre-paid and postpaid
  - Wholesale/retail Partners as well as Subscribers
- **Tariff flexibility**
  - Incentives at the operator level
  - Incentives focussed e.g additional airtime
  - Based on Time, location, date, content, ....
- **Charge by content value as well as by resource usage**
  - Need to coordinate airtime/volume and event charges
  - Differential charging by site; varies during call within single PDP context
- **Additional rating at the operator level**

Incentives across partners, loyalty, taxation, mark-up, discounts etc

**EXPLOIT CUSTOMER BASE TO ENHANCE OFFER TO  
COMMERCIAL PARTNERS AND INCREASE REVENUE**

**NORTEL  
NETWORKS**

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Mobile Payment Solution - 1

# Key Features of Proposal

- All accounts centralised on UP server
  - Subscriber and Partner
- All rating centralised on UP server
  - Single point of managing tariffs
  - Rating can partition charges across multiple accounts for revenue share
- All charging in real-time
  - Strong credit control
  - Advice of Charge and subscriber non-repudiation supported
- MCommerce handles all event based billing
  - Interfacing to financial institutions plus business rules
  - Get most from OEM relationship whilst maximise Nortel value
- All airtime charges directly applied to telephony accounts
- Coordination between usage and event charges via provisioning
  - Minimise complexity and overhead of correlation
  - Logs/CDRs/IPDRs allow off-line audit and analysis of usage as required
  - Exploits unique Nortel GGSN capability
- NGS encapsulates capability and makes available to third parties
  - Supports new multi-party business models

# Key Product Activities required

- **GGSN**
  - Enhance Destination Based billing to support
    - Zero-rated upstream traffic
    - Multiple prepaid rates via enhanced CTP
- **UP**
  - Provide API to rating
  - Support for multi-party rating
  - Support enhanced CTP interface to GGSN
- **Mcommerce**
  - Support unrated events and related events via API
  - Link to UP rating engine
- **NGS**
  - Support revised Mcommerce API
  - Potential SMPP SCF to be considered
- **General**
  - Core applications such as prepaid recharge



# Issues

- **Detailed engineering studies within each product**
  - Size and scope proposed work items
  - Validate solution approach
  - Identify capacity and performance implications
- **CAMEL/IMS On-Line charging/Std's Implications**
- **Further study on SMS charging story**
  - MO, MT and Bulk
- **IPR?**

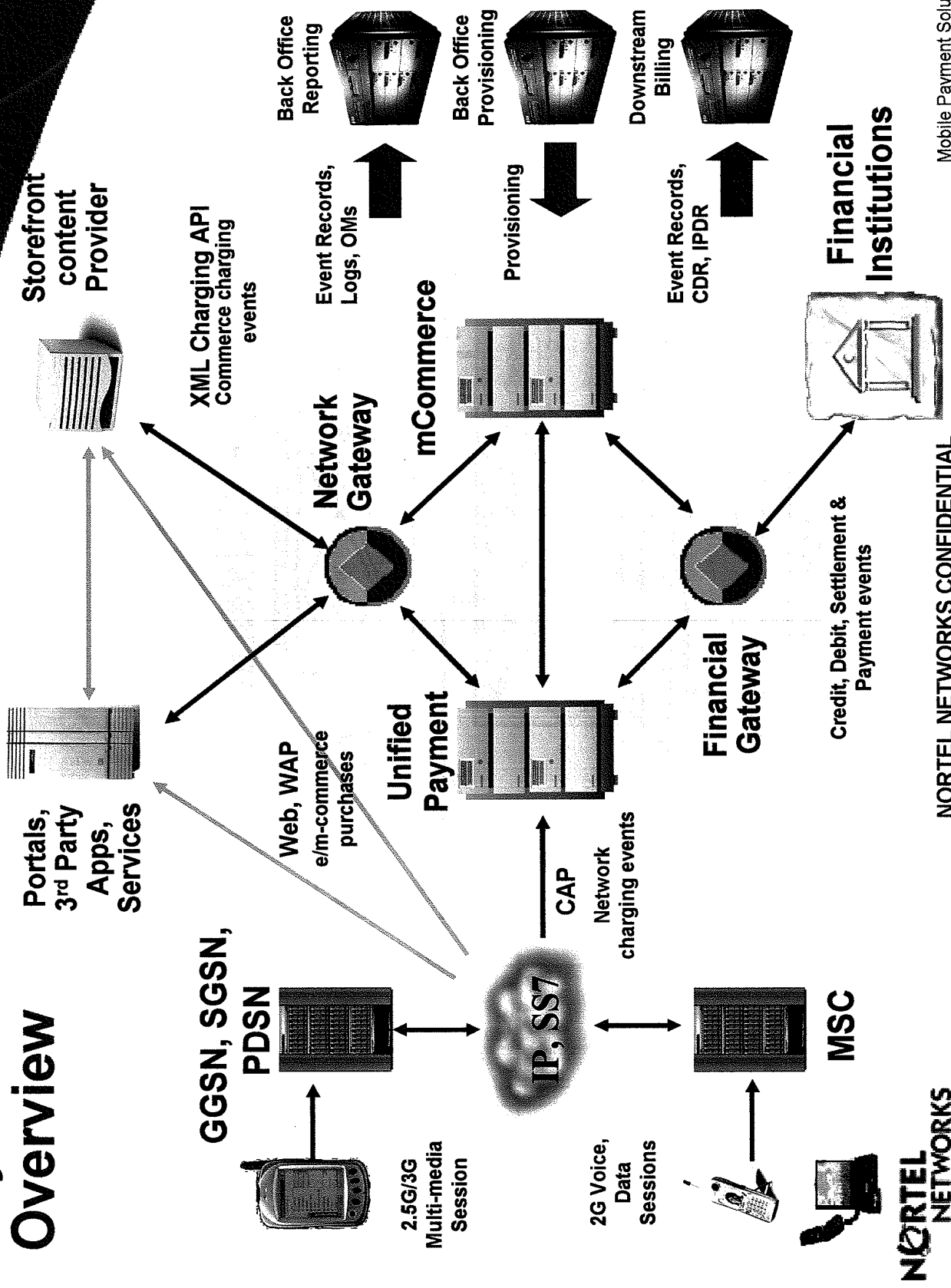
# Way Forward - thoughts

- **Endorse strategy across affected products**
  - Revise as required
  - Who needs to commit?
- **Agree revised interface points**
  - CTP
  - Charging SCF/Mcommerce API
  - Rating API
- **Review and align PoR/Pol**
- **Market collateral**
  - Coordinated market engagement strategy
- **Identify Lead customer(s)**
  - Possible candidates
    - OniWay (SB+ Mcommerce requirements lead in this direction)
    - mmO2 (Project Horizon proposes move to Nortel GGSNs + SB)
    - BLU (SB plus high percentage prepaid plus IPSE(Telefonica interest))



# **EXHIBIT B**

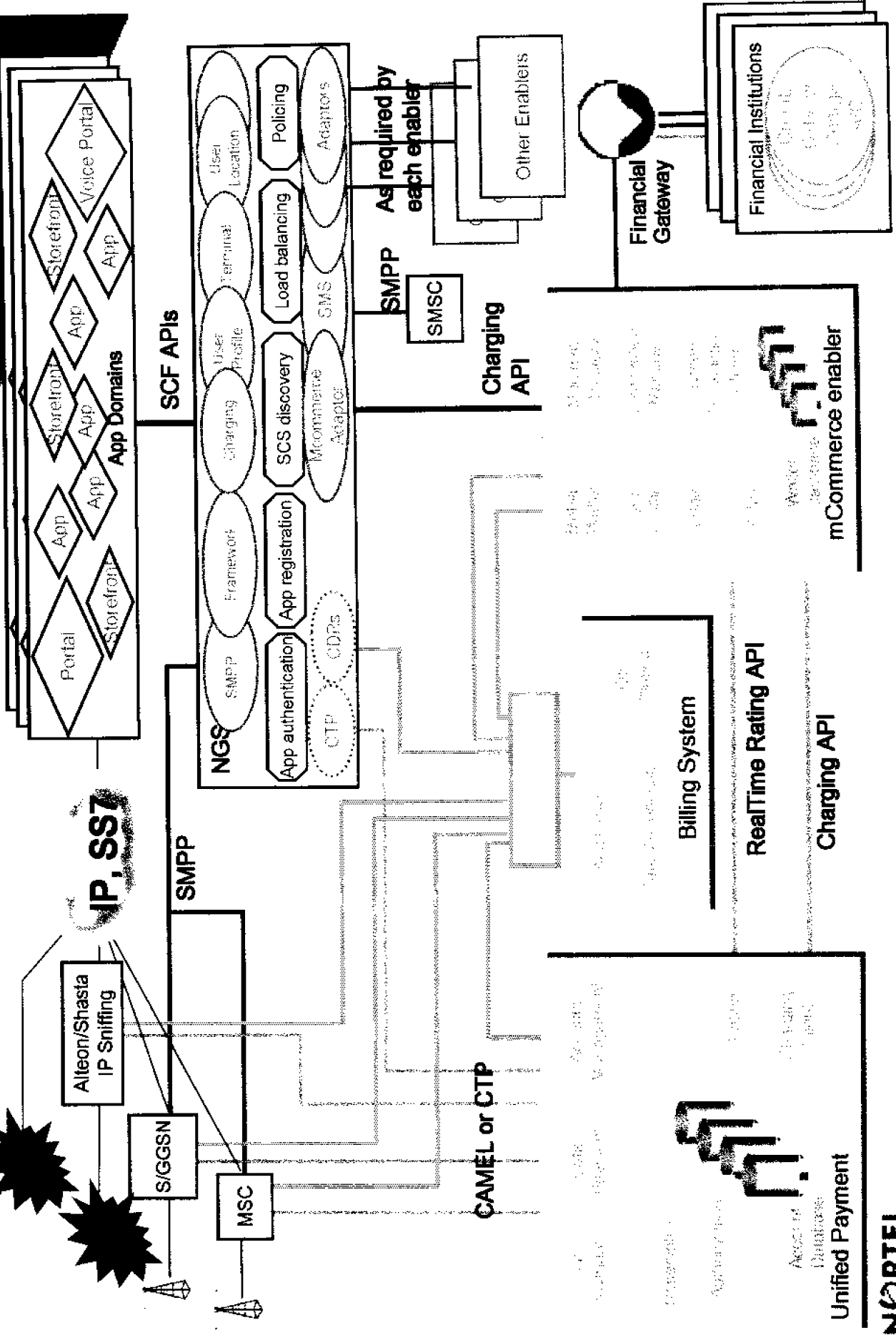
# Payment Solution Network Overview



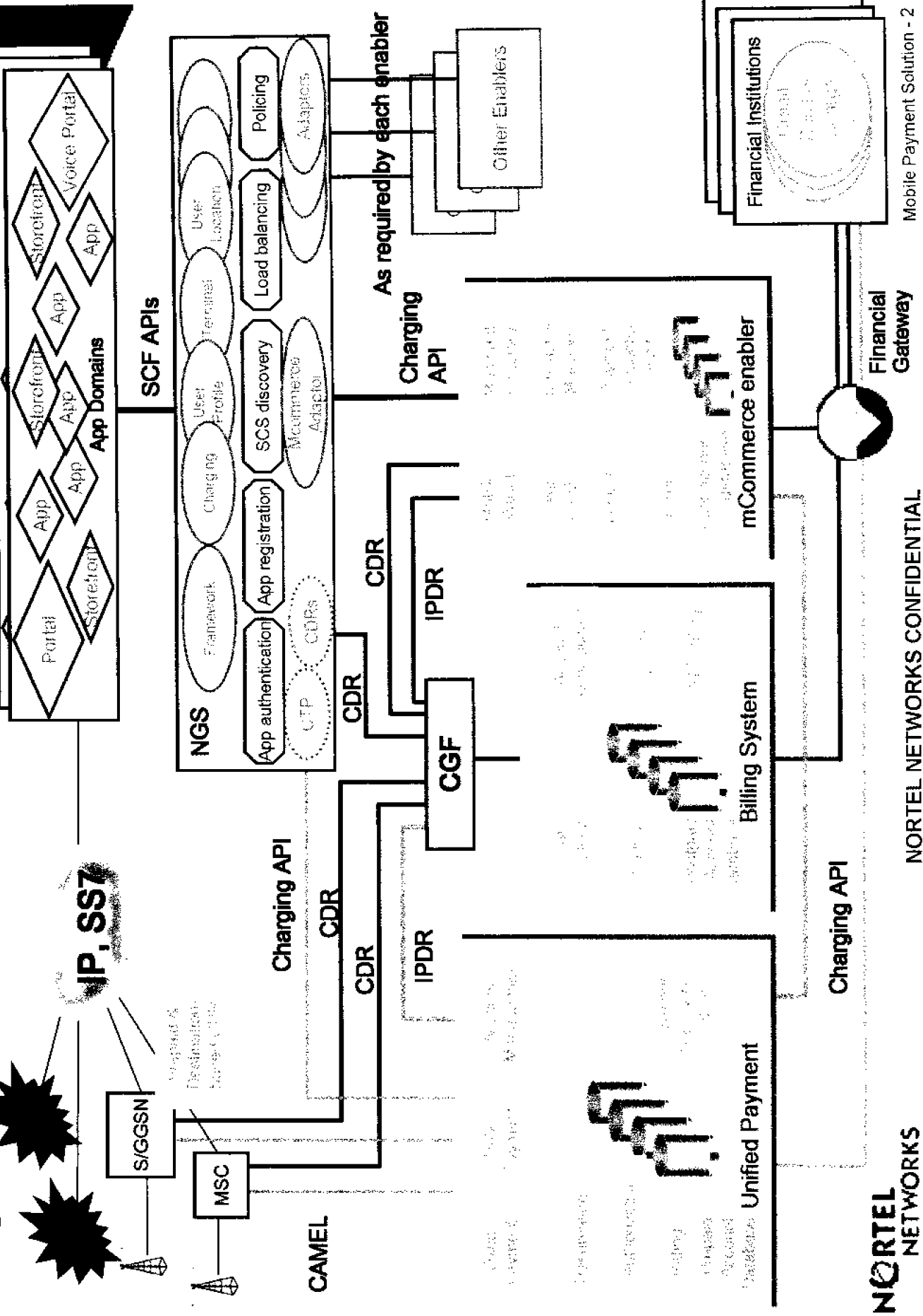
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Mobile Payment Solution - 0

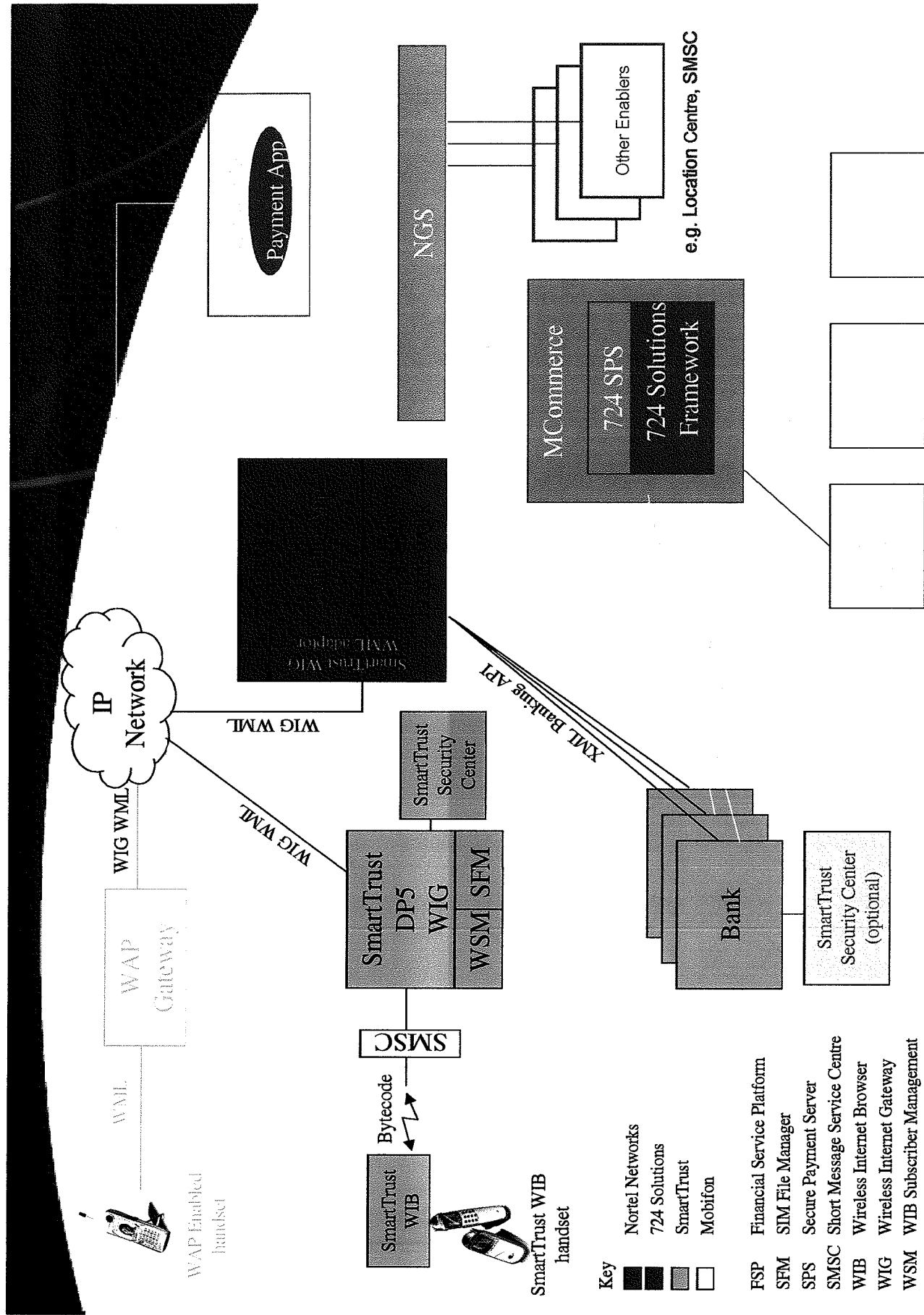
# Proposed Charging Solution



# Payment Solution Detail Orig

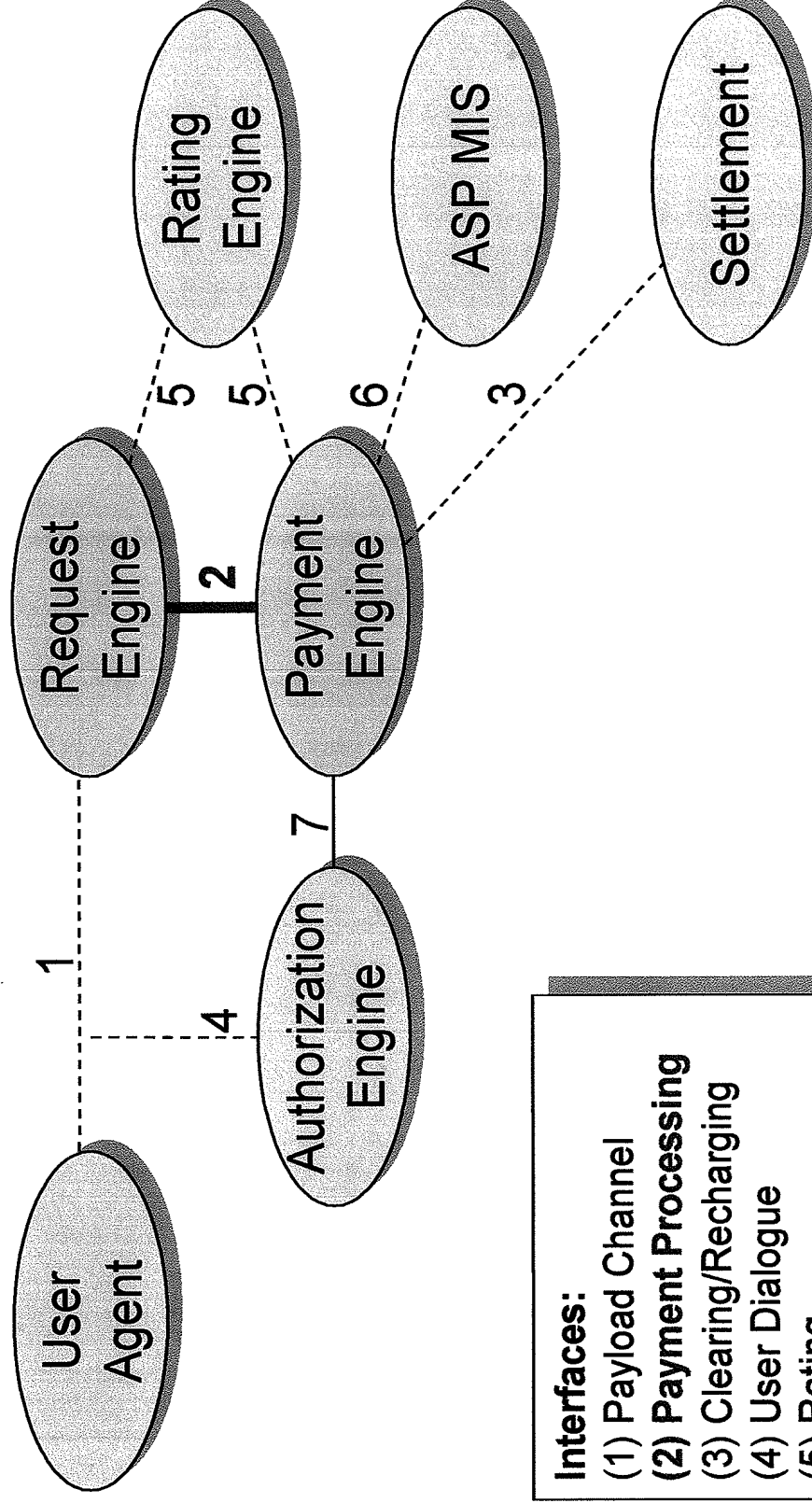






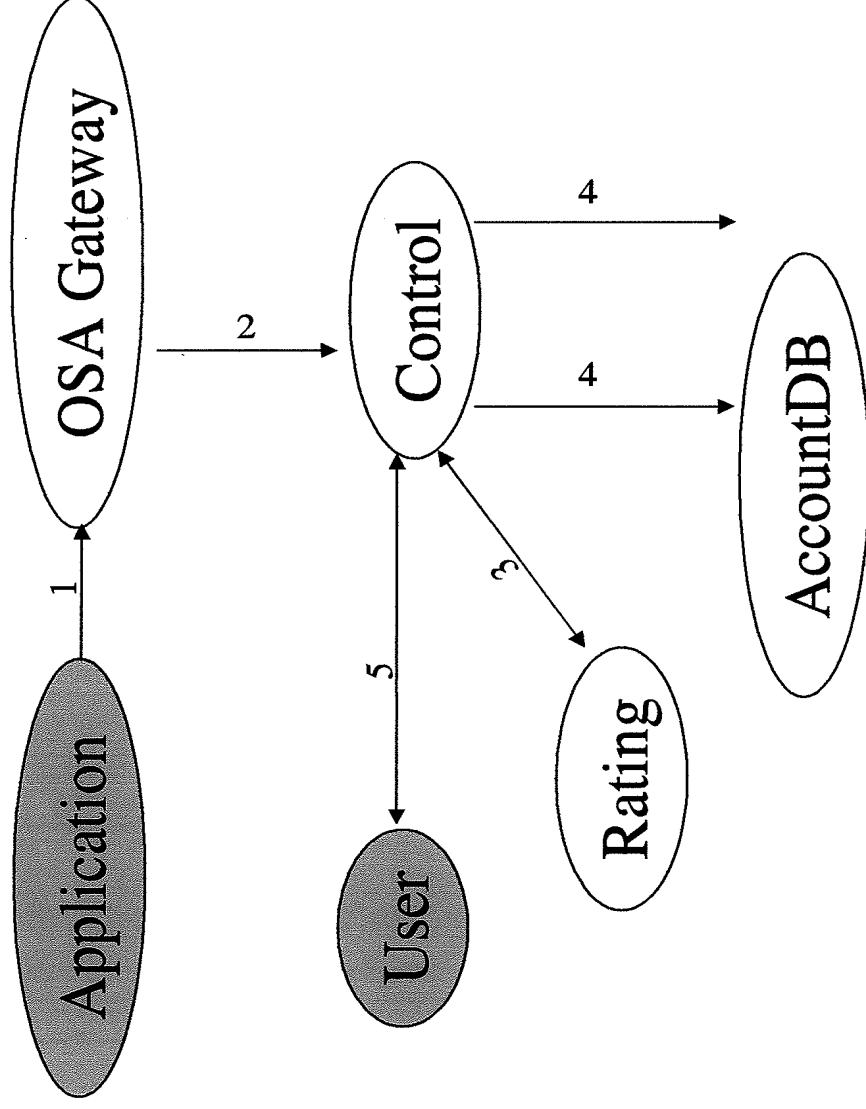


# Mapping to Parlay Reference Model

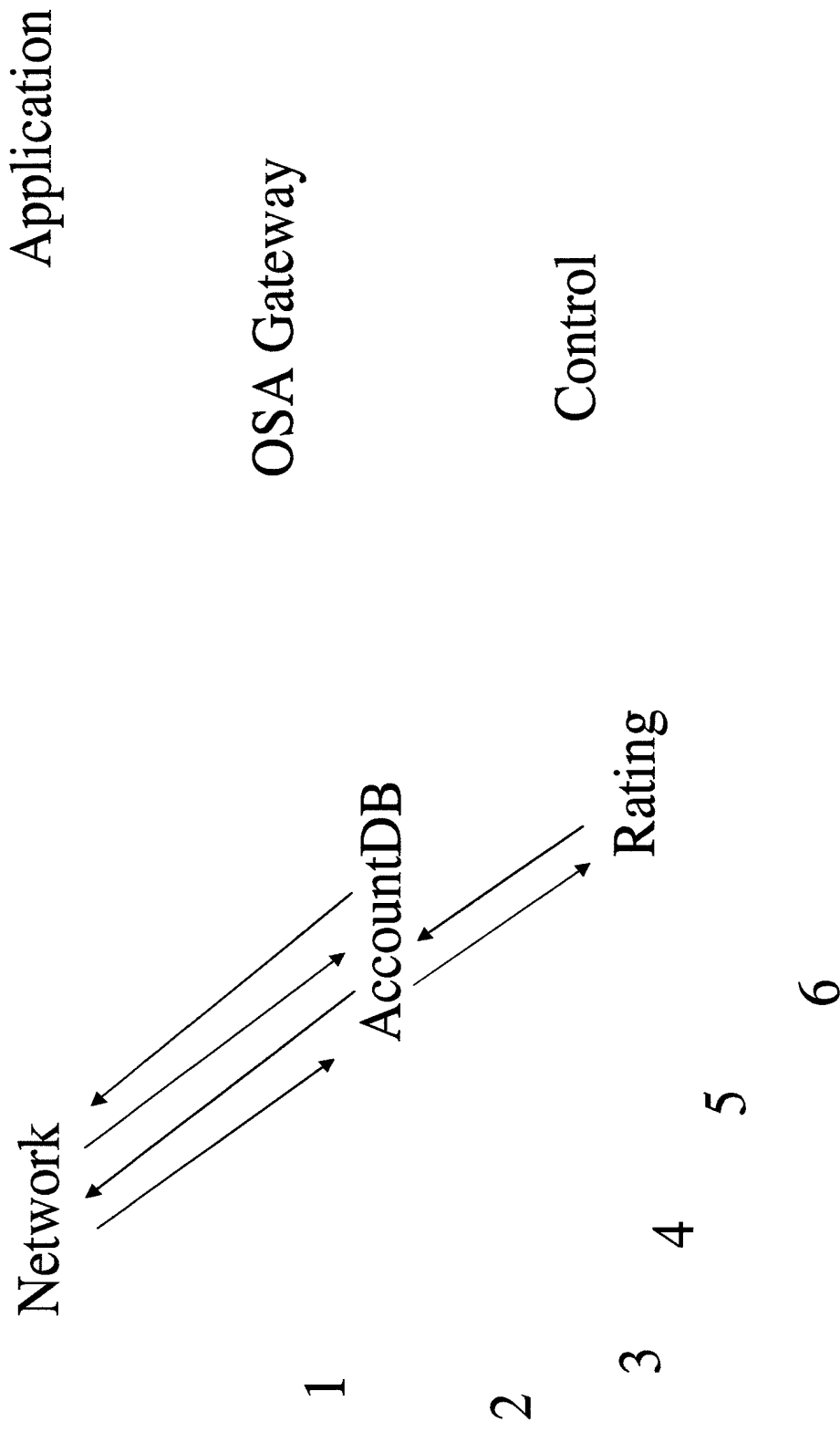




# Generic Solution and Event Call Flow



# Generic Solution and Call Flows



# **EXHIBIT C**

# **UMTS Charging Strategy**

Nortel Networks Strategy for on-line charging of UMTS provided goods and services.



**White Paper v0.1**

**Nortel Networks Internal Document Only**

November 2001

**RESTRICTED DOCUMENT Confidential Information**

Published by Nortel Networks



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# Revision History

Draft Issues 0.1      November 16, 2001 Tim Roberts, Robert Bell, authors

# Executive Summary

This white paper addresses the Charging Strategy for UMTS provided goods and services and recommends product and standards actions to maximize Nortel Networks' value. Key objectives include:

- Strategic input to product plans and integration of respective product strategies
- Influence in the industry fora and standards activities (3GPP, OSA, Parlay) for charging architectures and interfaces
- Creation of a cohesive charging strategy to identify competitive differentiation and value add from the overall Nortel Networks product suite

The recipients of this paper will include product owners of the various UMTS charging and applications and services components, design groups associates with these products, technical standards and planning, and UMTS product marketing.

Charging is a key enabler for goods and services provided by or transported through GPRS and 3G wireless networks.

Given the range of business models, types of services, and network or non-network elements involved, a traditional charging system such as postpaid billing is inadequate. The need to offer on-line services, digital downloading and access to third party applications with associated commercial transactions requires a secure, real time charging environment. Nortel Networks' customers, the wireless operators are on the front line and have the opportunity to enhance their networks' values by providing a single point for charging of UMTS related goods and services. Similarly, Nortel Networks products planned for mobile commerce and prepaid services that can be leveraged along with the Wireless Services Node strategy to deliver the charging infrastructure that will unlock the value of 3G goods and services.

This paper is critical to decisions being made now in standards bodies and in Nortel Networks investments. The 3GPP group is determining the charging requirements for IMS (IP Multimedia System) in UMTS release 5, expected to be ready for deployment in late 2003 or early 2004. These decisions will therefore have an impact on product development and investment programs for 2002 and 2003.

Key elements contained in the paper are:

- Business Strategy for Nortel Networks and our customers in UMTS charging
- Requirements Overview
- Solution description in terms of an architecture, functional relationships and internal or external interfaces
- Product plans that exist and how they relate to the charging solution
- Strategic input to standards
- Recommendations for incremental product capabilities

A preliminary distribution of this paper is being made for discussion purposes, to be followed by a review with product owners and marketing. Once agreement is reached on the strategy, the content of this paper will form the basis for contribution to standards discussions as well as product requirements.

Comments regarding this white paper should be returned to the authors.

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# Introduction

In today's 2G world, competitive tariffing is a key part of attracting and maintaining a strong customer base. As we migrate towards data and multimedia services, tariff will be a major factor in encouraging or suppressing the take up and provision of these new technologies and the capabilities they offer. In addition, in the data world there are new opportunities for innovative tariff models based not only on duration or volume of data but on the value delivered by the data which can be independent of volume or duration. For example, a video delivered at voicecall bandwidth rates would be far too expensive to be commercially viable and yet a text message via SMS, less than a couple of hundred bytes of data, can be charged at a disproportionately high rate. In addition to what is being charged, the data world will also add in new stakeholders in the value chain such as content providers and new business models with the network operator being wholesaler, retailer, credit broker or channel partner as required. Naturally, this will all need to work for prepaid, postpaid and direct access to financial institutions per the industry vision of M-Commerce. Equally governments will have an interest in both taxation (sales taxes and import/export duties and so forth) and regulatory domains.

In addition to the business model changes, the infrastructure must support multiple devices, family accounts, mixed business and personal accounts with different billing models for each, mix of fixed and wireless access and voice / data and handle roaming between different networks. Consequently a mobile operator's ability to offer a coherent payment services architecture that enables new services to be quickly launched and rating schemes to be easily modified depending on market conditions, vouchers, discounts, mark-ups, promotions, and so forth will be crucial to its competitive position and future profitability.

Traditional postpaid billing is a critical operational entity in the ability to deploy new services. The success enjoyed by Prepaid is in part due to its ability to handle charging in real time without the need for a downstream billing infrastructure. Using this flexibility, Prepaid has introduced a new paradigm into charging of network services. Migration to 3G networks will form an overlay of new services and capabilities that will stress traditional billing methods. In line with the world of e-commerce and on-line transactions, 3G services require real-time non-repudiation, fraud control and service charging flexibility without incurring high capital expenditures or delays.

In order to offset the increasing complexity of this problem domain, it is imperative to simplify the solution as much as possible. In particular a single

point of provisioning of tariffing data such as special offers, a single system to manage customer accounts and as single entity to control and manage access to commercial partners are key facets of the solution. In addition, a simple yet powerful capability to address some aspects of value based billing is required. Analysing and maintaining context of every packet of every application session for every user is a challenging task so a solution is required that offers a sufficiently granular differentiation of packet streams without the massive overheads of the full context sensitive analysis.

## **Business Strategy**

Nortel's customer base moving forward is largely brown-field sites. There are a couple of new entrants to the 3G space but typically, we will not be able to position an entire solution. In addition, the 3G space is increasingly addressed by a small number of large Pan-European or global players with presence in many geographical regions. Finally, in the current market climate, we must have an incremental solution which can exploit existing solution components to penetrate the market but have a compelling story as to why incremental capacity should be offered via Nortel solutions.

The compelling solution will be one that offers flexibility for new revenue generation and yet limits new capital expenditures and ongoing operational expense. Opportunities exist to consolidate and replace some functions currently using separate systems, such as voucher management and communications gateways.

In order to maximize revenue potential for Nortel, we have aimed to maximize Nortel in-house value followed by OEM'd capabilities and minimized the value of the remainder of the solution for which Nortel has little or no offering (notably post-paid billing). So the strategy is to be able to convincingly articulate a solution which covers a substantial proportion of the required functionality, well-defined interfaces where legacy systems may be substituted for the Nortel preferred solution and an evolution story which shows how the system will scale in terms of transactions, subscribers and other key parameters. The overall story convinces customers that Nortel has a vision of how to deliver against their requirements, the modular approach enables a cost-effective evolution to the Nortel strategy and with success of our customer, our evolution story offers the opportunity for incremental upsell of the other components in the solution. Since those other components include the GGSN, it offers some potential for generating core network component sales where this is provided by a competitor with corresponding upsell opportunities for the rest of the core network solution. Since the solution is neutral to the radio technology it is globally applicable subject only

to market readiness of the individual product components for those markets. Since it builds on NGS, MCommerce and SB/WUP, the business case for going this route can leverage each of those domains and show incremental value on top – the whole is greater than the sum of the parts.

A key enabler within this charging strategy, therefore, is to be able to use the common charging strategy to leverage each Nortel Networks product by showing connected value to the other components. An existing ServiceBuilder Prepaid customer can add GGSN, m-Commerce or NGS. NGS success can leverage mCommerce and Wireless Unified Payment. The customer's buying choice criteria are met by re-using existing investments while adding value and reducing cost/complexity of new service charging capabilities.

## Requirements

As operators concentrate on introducing 3G networks and services they are looking for the revenue generation that will support that infrastructure. However, there are many different strategic approaches being followed, depending on the operator's organizational breadth and resources. In general, operators will look for one of three strategic paths:

- 1) **“Own the customer”**: The wireless service provider is positioned as the point of contact for the customer, essentially owning the user relationship with all digital transactions as well as network usage and services. This requires capabilities that offer wireless services, wireline access, mobile wallet/profile, and ISP services (digital content and e-commerce)
- 2) **“Own the merchant”**: The wireless service provider adds to their network services revenue by offering a charging mechanism for digital goods and e-commerce transactions. The charging infrastructure for 3G services can be leveraged to offer a charging mechanism for merchants delivering content or providing e-commerce websites. This requires the capability to interact with the merchants on a financial basis.
- 3) **“Own the network”**: The ‘default’ option for wireless service providers is to at least ensure that all network usage and services charging can be captured as the network is grown from 2G to 3G. The operator does not need to be involved with the 3G content delivery or other e/m-commerce activities, but must be able to capture service activation and usage in innovative ways, including charging for delivery value.



Depending on the individual strategy, a number of factors need to be considered:

- The promise of m-commerce in general is to offer the mobile operator a chance to leverage their subscriber base e-commerce potential to improve revenues by emulating the success of credit card companies. Maximum revenue is obtained if the subscriber uses their pre or postpaid account rather than actually charging to a credit or debit card.
- Tariff and tariff flexibility is a key competitive tool and will continue to be so.
- The ability to charge based on content value rather than duration or data volume is critical; an SMS is less than 200 bytes and is very profitable but a videocall cannot attract the same profit per byte!
- The ability to charge based on network value rather than just usage time or distance. Values can be in terms of quality, bandwidth, guaranteed throughput, consumer and source locations, user identity information, merchant identity information, account profile metrics.
- There is a need to share charges amongst various stakeholders e.g caller, callee, site, sponsor, government, access provider, roaming network partner etc.
- Need to reduce subscriber churn especially at the end of contract periods.
- Advice of Charge to support the regulatory thrust towards clear pricing information prior to user buy decision to facilitate competition and transparency
- Credit and Fraud Management demand an on-line charging function with secure authorization and non-repudiation features.

## Solution Overview

### Vision

The solution vision lays-out the idealized overall strategy. The next section maps that to existing Nortel products and identifies short term limitations with a view to informing product strategies.

The overall solution must capture chargeable activities for user and/or merchant actions related to services, usage, digital content and transactions.

The generic solution splits functionality into 4 main components:

- 1) A **Unified Account Database** supporting real-time updates to user balances including the usual reservation model supported by today's prepaid solution. This component also provides management and user access to account balance information for customer care functions. This component must scale to support all the subscriber base for the operator and, ideally, also an account for each 3rd party partner through which the various business models can be supported. Balances must be capable of being positive or negative and have a credit or debit limit (preferably soft and hard) per transaction, per user and per account which is enforced in real-time. Where a credit limit is reached, this component may initiate credit limit increase request and/or recharge opportunity via credit/debit card. Positive authorization, reservation and confirmation features are required. The account database has all the attributes of a real time accounting system in terms of its robustness and reliability.
- 2) A **Real-time Rating Engine**. This provides the single point for all rating and tariffing data including such capabilities as voucher management and advice of charge. This engine also applies various operator level policies such as discounting, mark-up, taxation, etc. Its function is to accept charging events with relevant data (such as time of day, event type, subscriber, merchant, possibly dollar value) and return the value to be charged to the customer along with any details about charges to be applied to other accounts e.g. merchant for revenue share. Note charges may be credits or debits.
- 3) A **Charging Control Function**. This component receives the charging events, gets the value rated, supports wallet functions and operator business policies to decide payment source, checks/reserves credit as appropriate, initiates and tracks transactions, interfaces to the financial institutions and reporting systems for payments, settlements and accounting.
- 4) An **OSA Gateway Function**. This offers the charging capabilities to third parties in a controlled and secure way. The function of this component is to validate 3rd party identities, offer a charging API in a convenient form for the application and to do this in context with access to other operator provided capabilities such as location information, call set-up, bulk SMS and so forth.

This infrastructure must also process transport charges generated by network elements notably volume and duration based billing for voice/data over packet or

circuit switched connections. Since this is the operator core business, these charges are always applied directly to the user account and the elements interface directly to the accounts database component which arbitrates the rating aspects in an extension of the current prepaid solutions to all accounts. Use of the common rating engine, support for multiple charges and holding of merchant accounts within the accounts database enables the sharing of charges amongst multiple parties and provides for revenue sharing e.g. 0800, Premium rate type functions.

This supports two primary call flows corresponding to event charges or duration/volume charges. The flows below are generic and logical communications and need not always all occur.

## **Generic Event Charge call flow**

Events of this style are generated by applications however, these maybe generated by the OSA gateway on behalf of the application if required e.g. a location look-up request could always result in a charging request being generated. This would be the normal model for wholesale functions where the app provider is charged for the operation since the operator would wish to generate the charges.

- 1) App sends Event Request for Authorisation to OSA Gateway
- 2) OSA gateway forwards request to Control with any additional data including authenticated application id.
- 3) Control invokes Rating which returns price of event (possibly based on historical data etc). Note that the event may already have a price, but this is potentially changed via Rating for taxes, vouchers etc.
- 4) Control checks with policy whether authorisation and/or Advice of Charge is required and preferred method of payment (account vs credit/debit cards etc)
- 5) If Auth is required, Control performs necessary check (against balance or credit limit as appropriate)
- 6) Control returns yes or no plus price and AoC indicator to app
- 7) App does AoC and proceeds to perform event and then generates event confirmed/denied back to Control
- 8) Control commits/revokes transaction (s) as required

- 9) All elements produce CDRs as required for audit, reconciliation, marketing etc purposes. Note that App may not be in operator domain, so app CDRs cannot be relied on.

## **Generic Duration/Volume Charges call flow**

This follows the traditional prepaid call flow, but the destination data is required for the granularity of billing. It is necessary that this flow be heavily optimized.

- 1) Network element (MSC or GGSN) receives request for call or packet to/from destination
- 2) Network element requests coupon<sup>1</sup> from account DB per standard prepaid model in terms of time or volume with destination and source data
- 3) Account DB forwards to rating function to determine amount and account(s) to be charged.
- 4) Account DB provides coupon or refers to recharge/credit increase
- 5) User interaction occurs and on exhaustion of coupon repeats from 2)
- 6) On termination of interaction, partially used coupon data is returned to Account Db and refunded to relevant account(s).

Since any interaction with a service is via some connection, the two charging models will occur in parallel. It is important for such activities to be coordinated. This is already supported in voice call processing through 800 style functions. This will be achieved in the packet domain through use of destination charging rules provisioned in the GGSN. Where charging is related to content or application, rules within the GGSN will be triggered and this will result in different charging rates being applied. One such rate will be zero to the subscriber allowing for free interactions with applications. This allows charges for network usage to be suppressed, but for charges to be applied via the event mechanisms e.g. purchase of an electronic good such as an MP3, charges to be applied to the 3<sup>rd</sup> party e.g. advertiser, or the interactions to be free e.g. access to a recharge application or other customer service function. Additionally, such mechanisms will support sharing of charges e.g. between application provider and subscriber for subsidised browsing, between application provider and operator for revenue sharing/premium rate sites and so forth.

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<sup>1</sup> Coupon: also referred to as a voucher, reservation, or bucket usually only if terms of currency.

Current pre-paid accounts are the model for this approach and are naturally supported. They have a credit limit of zero. This solution would allow for a soft limit of zero and a hard limit of a small amount to allow for controlled completion of current call/activity, for an "emergency" use and to generally improve customer relations. The agreement with the customer would announce the soft-limit, but the flexibility to go a bit over would generally improve usability and allow the operator to improve customer relations by being tolerant. Of course the hard limit could be the same as the soft limit to fully mimic today's solution.

Post-paid accounts would have some operator set credit limit, which could change over time or in response to customer request. This is exactly analogous to credit cards today and is necessary for the same reason since we envisage e-commerce transactions being charged to the phone account. In addition to the solution described above, the ability to prepare a bill for the user and also for merchant settlements and general accounting is required. This would come from post-processing the records cut by the account DB and through DCR/IPDR from the network elements to ensure complete alignment between account status and physical bill. Settlement of the account could be handled via an application to charge to the users credit card either interactively or by prior agreement.

## Nortel Products

The proposed Nortel Networks solution is constructed as follows:

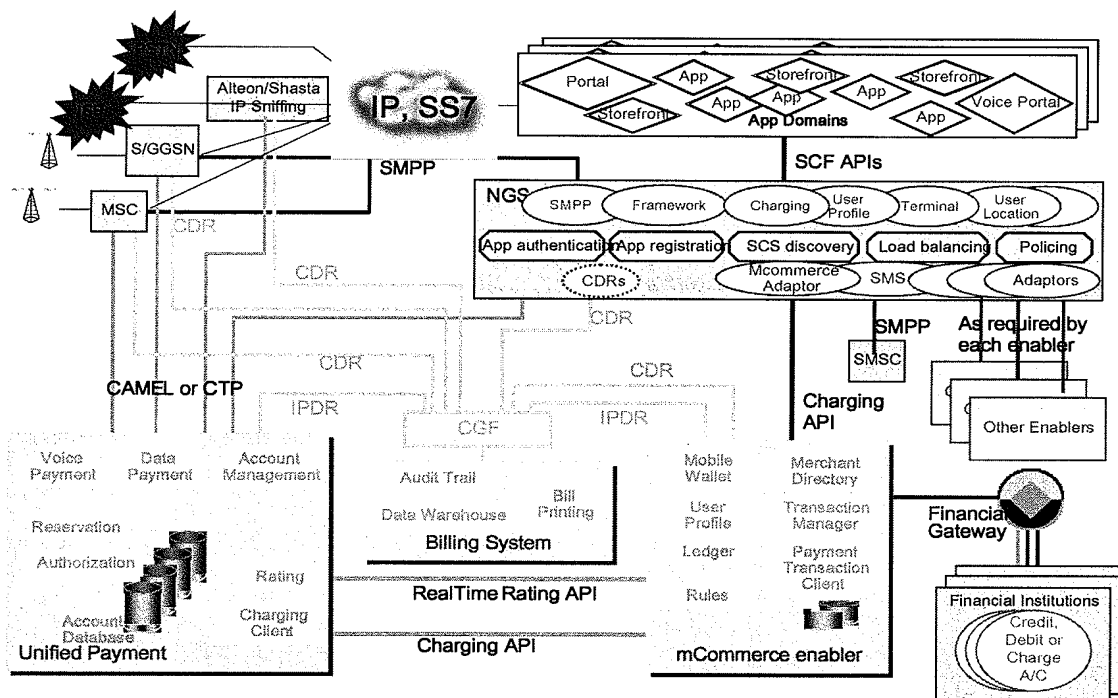
- Account DB and Rating engine from Wireless Unified Payment
- Control function via mCommerce
- NGS for the OSA gateway
- and the Shasta GGSN which provides the destination based information necessary to support the full flexibility of the solution.

However, additional data could originate from an Alteon/Shasta IP sniffing function, which could additionally address packet data to and from wireline networks and also CSD content if required. Such functions naturally align with firewall capabilities on the boundaries of the operator domain since they must be in-line to enforce credit limits in real-time. The choice of solution also impacts the network engineering and architecture in order to ensure that all necessary packets are rated in this way and that the solution scales adequately. The GGSN based solution is the most convenient solution for the wireless operator and

Nortel and the business opportunity for a packet sniffing solution based on Alteon or Shasta is for further study.

These are combined in a modular way to enable existing legacy solutions to be integrated in an evolution strategy. Relevant standard interfaces between these have been identified where they exist in order to support the integration of legacy components. The current products do not provide this complete solution today and further details around the PoR analysis indicate the gaps and suggest the relevant feature requirements. See Product Roadmap

**Figure 1** shows the logical network architecture proposed along with some of the functional capabilities.



**Figure 1: UMTS On-line Charging Architecture**

## Notes

Transport charges (i.e. not event based charges) are automatically applied to the subscribers account with the operator. If SIP is used then transport charges may be raised by SIP components based on the media type transported. When user

browses to a premium rate location, it may be necessary to alert the user and Shasta Personal Network Portal capabilities may be able to provide this.

Recharge is an application that exploits charging SCF. Automated account payment can be an app that utilizes a subscriber's wallet facility to recharge the account to zero on monthly basis using MCommerce to interface to the Financial institution. The user could be asked to confirm the payment in the normal way (must check on line or initiate a call or have an agreement in place). Note that recharge application may reside on the Voice Portal and Periphonics would be able to offer this function.

Merchants and commercial partners will also have accounts and can accumulate charges etc and this can be used for settlement. With funds being swept every period in which ever direction is required. MCommerce can be used to process the funds transfer via the financial institutions. This unifies accounting for suppliers and customers in all commercial models. This simplifies the account management and access into the same mechanisms used in each case. Consideration will have to be given in the current mCommerce product strategy as to the management of both user and merchant accounts and transactions between them.

The use of WUP for accounting and rating functions enables the efficient implementation of the duration/volume charging call flow and reflects the current product capabilities. In order to form a true on-line charging function, this element will need to implement a range of capabilities which are currently in planning, involving prepaid, postpaid and hybrid services.

A key additional enabler is the ability to perform a 'rate & reserve' function via the rating API. This allows for externalization of the rating engine as well as extension of funds reservation to external applications. This would form a basis for the wireless operator to compete with credit-card based e-commerce and offer an account consolidation (micro-payments and multi-purpose charges in a single user account).

SMS/EMS sending (either from a mobile or from an application) will trigger an event either in Camel III direct to WUP or via SMPP proxying at the NGS or via the Notification SCF at the NGS. For Bulk SMS/App SMS via NGS Notification SCF, NGS sends the charging event to MCommerce for processing.

The overall approach to SMS handling and SMPP flows needs to be validated.

UMS/MMS is an application which will incur transport and event charges as required via the mechanisms above.

# Use cases

## Single operator scenario

### Usage based charging:

**Uses:** **browsing**(especially public internet), **voice call** (either circuit or packet), **video call** (circuit or packet).

CS voice or video are suited to duration based with browsing more volume based. Browsing could also move to a value base approach with a price per page rather than price per byte. This can be achieved either by zero-rating the transport and requiring the web server to generate the event charge, but more likely through IP sniffing capabilities, which would analyse the HTTP sessions to determine page download and success.

**Call Flow:** call set-up triggers CDR creation in GGSN. Authentication at network level (i.e MSISDN based) only. Nortel GGSN destination based charging into zero rate plus four other rates plus normal rate. As user browses between sites, the GGSN matches site IP address/URL etc and places costs in relevant tariff CDR. GGSN interfaces direct to WUP via CTP to do rating and real-time usage based charges

### Event based charging:

**Uses:** For example, purchase of MP3 (desire to incorporate delivery charge into price i.e zero rate the download but not the selection), find and Guide instance.

**Call Flow:** network authenticates user and GGSN establishes billing per Usage based scenarios. User connects to storefront and browses (packets being charge based on storefront, APN and operator policy). User selects MP3 track and hits buy. Storefront utilizes charging SCF (possibly via portal - need to understand this) to request authorization for transaction giving amount. NGS passes to mCommerce which using business rules applies operator rating for taxation, mark-up etc. and determines user payment method. MCommerce then checks credit limits with either the SB/WUP account or via the payment gateway to the financial institutions based on user preferences etc. Checks back to user to confirm purchase. If approved, provides confirmation and transaction id to storefront, which provides MP3 (one time) URL to client. Client invokes download on URL. URL or server virtual domain/IP address is part of GGSN zero-rate filter. Download packets are collected in the zero-rate bucket and no charge forwarded to the user



account. On complete download (or perhaps after one-time URL allocated), storefront indicates transaction complete to the charging SCF and MCommerce then commits the transaction either to the user's account or directly to the financial institution. Payment occurs when the user and/or merchant account is reconciled through a transfer of funds (for example by charge to credit card).

For **Find and Guide**, instead of storefront charging for a purchased good, charging potentially occurs for the network based position location request, plus the delivery of the map information from the third party. The map itself could be downloaded free per the MP3 case with transport charges included in the price per map. Settlement in this instance involves recognition of the split for location request, transport charges and the provision of a map. Advertising revenue also adds complexity (e.g. ad on the map, locations of McDonalds being shown etc - best to assume these are separate commercial issues which are incorporated into the end-user price, but may involve collection of data).

### **Sponsored Charging:**

**Uses:** Free, or credit (to end-user) access to recharge facilities, customer care, 0800 facilities/destination pays, advert download.

**Call Flow:** call set-up triggers CDR creation in GGSN. Authentication at network level (i.e MSISDN based) only. User selects customer care. As user browses to free URL, these match the zero-rate filter for their APN and packets are not charged to the users account.

Ideally, usage charges in such will be cross charged to the content provider or sponsor. This is done by the SB/WUP rating engine on request of coupon for usage to the site. In the case of 0800, the rating determines a cost which is applied to the merchants account. Successful debit to the merchant account will result in allocation of a coupon and the browsing proceeds normally. This is identical to the mechanisms used to charge usage to the subscriber, only it is the merchant's account that is charged.

### **Premium rate charging:**

**Uses: Premium rate or reduced rate:** Service fees via sharing of usage based revenue e.g. customer support (esp PCs), competitions, etc

**Call Flow:** call set-up triggers CDR creation in GGSN. Authentication at network level (i.e MSISDN based) only. User selects premium site. Nortel GGSN destination based charging allows site to match an alternate rate filter. Cost sharing such as some kind of reduced call rate, would result in rating engine determining two (or more) transactions to the relevant co-funders (e.g.

subscriber and content provider) all of which must succeed for the coupon to be allocated. Unused balance refunds via the inverse operation. Premium rate content provided via generating a higher cost to the subscriber and crediting the merchant account on allocation of a coupon. Unused balance results in refund to the subscriber and debit to the content provider. Some forms of taxation may be addressed via a similar mechanism if required.

## **Value based Charging:**

**Uses:** charge differently for VoIP/Video Streaming for other packet services to ensure competitive voice offer, real-time stock quotes, goal flashes, etc.

**Call flow:** Similar to event based charging (e.g. per goal flash or stock quote), application can generate charging request via charging SCF. For usage based (e.g. voice vs video content from same site) some content analysis must occur and no solution currently available - investigating Alteon capabilities here.

## **Roaming Scenarios**

### **Outbound roamer**

In the outbound roamer case, the traffic is routed back to the Home GGSN from the Foreign SGSN. The operator may receive CAMEL III charging requests from the foreign SGSN and can process these, but for packet services it would be preferable to simply charge as per the current model via the GGSN. The SGSN Id will indicate whether this is a foreign or home SGSN involved and a suitable increment to the charge can be made accordingly. This requires the current SGSN Id to be passed to the rating engine.

All scenarios proceed as per the single operator case, with additional transport charges being incurred to account for settlement with the foreign network provider. Again the use of a pop-up generated by Shasta GGSN personal network portal functions is being investigated as a method to indicate these additional charges to the subscriber.

### **Inbound roamer**

Assume inbound roamer is routed back to home GGSN in the foreign network. The local network SGSN will generate CAMEL III triggers back to the foreign network Prepaid SCP per indication in the HLR. If the roamer is post-paid, the CDRs generated may be used for settlement per current model. For a more sophisticated model, the data may be used to update an account for the Foreign network operator and used to trigger settlement via a

Charging API. The subscriber id will indicate an inbound roamer and the rates calculated by the rating engine will take this into account.

Inbound roamer access to applications will be addressed by the foreign network infrastructure.

## **Hand-off issues**

Hand-off between cells, base stations and even SGSNs within the operators network is transparent to this solution. The use of GGSN as the anchor point for volume and duration billing provides a single common point of charging, which is maintained throughout the user session.

If this hands-off to an alternative operator, then the GGSN will still be a static point in the session since the remote calls will be routed back to it. However, hand-off to a foreign SGSN is likely to require additional charges. So when the GGSN detects a foreign SGSN, it must flush the existing charging information (i.e. return any unused coupons for refund, cut CDRs and refresh in order to charge at the new rate which would allow for the foreign operator's roaming charge. The charging situation is then as described in Roaming Scenarios above.

## **Solution values and match to requirements**

Use of a single centralized database for all accounts both subscriber and commercial partners, simplifies the overall management of the system and integrates revenue sharing with revenue collection into a single repository. This symmetry also allows the operator to apply many of the same credit management functions to commercial partners as to subscribers. This makes it feasible to support more, smaller partners via simpler commercial arrangements, indeed application providers can work on almost a prepaid basis if they choose to collect revenue directly. In the case of revenue sharing, the operator can extract his or her share, plus any additional costs (e.g. charges for account enquiries etc) prior to settlement and maintain a real-time view of their financial status vis-à-vis their partners.

The merging of pre and post paid models behind a single system allows subscribers to migrate between these forms conveniently and easily and supports hybrid forms e.g. family accounts giving children credit limits but the parents postpaid, all combined to the same account. The power of the WUP multiple balances can support more complex tariff plans and support complex vouchers ensuring that special offers and credit are applied to the services that were intended e.g. credits of airtime are not converted to a cash value that can be used to purchase goods with. This also supports devices shared

across multiple accounts allowing the user to distinguish between business and personal use and direct charges accordingly.

The use of a single rating engine at the operator level incrementally enhances the operator's ability to differentiate their offerings through promotions etc. At the same time it reduces management complexity by offering a single point of provisioning of tariff data. When this is integrated into the account DB, as is the case with WUP, performance for common small payments (such as duration and volume charges) is enhanced without sacrificing the control and simplicity offered via single accounts and single rating engine. By offering a Rating interface, the opportunity to position WUP purely as a rating engine in the first instance with the corresponding upsell for further functionality in due course is created (but would need further study to validate it as a business proposition). This single rating engine allows the operator to offer their own discounts and incentives which can be honoured across all their partners. Rating by the operator in no way precludes rating by the application provider e.g. for on-line stores, but it does offer a point for promotions, taxation, mark-up, delivery charges etc. and to make the total charge visible to the subscriber prior to confirming the purchase. This operator rating function can be optimized out if it is unnecessary.

The control function allows us to enhance these capabilities to allow multiple methods of payment in addition to the Phone account. This also applies to providing a mechanism to facilitate paying the phone account via these other methods. It can also be used to perform settlement with the operator's commercial partners. Use of m-wallet functions offers enhanced security to the customer via trust relationships being solely with the operator and no credit card details need be made available to the 3<sup>rd</sup> party merchant. This enhanced confidence level will help stimulate on-line transaction volumes. This also enhances the operator's value to the 3<sup>rd</sup> party merchants since it allows those merchants to access more of the credit potential in the operator's subscriber base. Full support of a pre-paid model allows the operator to build subscriber base of those unwilling or unable to get credit cards without taking undue credit risks. This in turn brings in that community as accessible customers to the commercial partners of the operator. In particular this allows under 18's to buy on line through their prepaid account – an important segment to many vertical markets such as music and entertainment and a segment which is historically more willing to use such facilities.

The OSA gateway model provides the way to package up these capabilities and offer it to those third parties without requiring extensive (and expensive) development and test cycles to guarantee network integrity. The OSA model does not just offer access to charging facilities but also to other network functions such as location information, call control etc. Use of OSA provides

this charging function in addition to those, which helps to improve the overall value proposition to 3<sup>rd</sup> party developers.

In addition the OSA gateway can itself apply intelligence to the transaction. For example when a third party application requests location information from the network the OSA gateway can not only resource that request but also initiate an associating charging event.

To simplify content-based billing, content value is differentiated by the location of the content (IP address or URL). This information is pre-provisioned statically as required by the operator. Thus if the operator enters a deal to provide premium rate access charges as a billing mechanism for a site, the Operator implements the agreement by provisioning the relevant URLs as required into the GGSN. This is a sufficiently powerful solution to address most such requirements but does not impact network architectures or require an additional component in the network to perform the analysis avoiding a significant increment to cost, complexity, latency and resource usage. The limitations lie in the depth of analysis of the stream and support for wireline traffic. Some of this may be addressed through the SIP standards supported of the SIP call control functions, but this only applies to SIP sessions and will first appear in the R5 standards. An alternate solution to these requirements is via an Alteon/Shasta based IP sniffing solution which would interface direct to the Account DB in the same manner as the GGSN and MSC. This is a simple direct incremental deployment, which can be deferred until the specific need arrives and deployed in a very targeted manner to minimize the impacts on cost, complexity, latency and general resource usage.

## Requirements Summary

- The solution allows the operator to provide access to their subscribers base credit capacity in both Phone account and other credit/debit facilities from financial institutions.
- Tariff and tariff flexibility is supported and simplified via the single rating engine and powerful multiple balance accounts. This allows new tariffs to be easily and incrementally applied without multiple updates to multiple components.
- Content-based billing is enabled by GGSN differentiation of traffic based on destination. If this isn't sufficient then R5 offers SIP based charging and an IP sniffing solution could be deployed via Alteon or Shasta.

- Network Value based billing is handled by the rating engine since charging interactions from the GGSN either provide the relevant data or the real-time rating engine can request the data e.g. location. One advantage of real-time rating is that as these values change, the charge rate can also be changed.
- The operator rating function allows the total cost to be charged or shared across multiple stakeholders. This directly supports revenue sharing and subsidized access models to the packet domain that are available in today's voice telephony domain.
- Data warehousing in the context of single account and single source of rating will facilitate analysis of subscriber patterns in order to identify the optimum tariff plan for that user. The wallet functions, automated settlement and the ability to easily use phone accounts to purchase items when other credit sources are unavailable will make the users life easier. On-line access to account balances through fast efficient customer care functions will reduce the number and degree of typical account management problems which constitute the bulk of enquiries to customer support lines. This solution makes it quick and easy to add new tariffs and hence remain competitive. Usability and tariff are only part of the retention story, but these facilities will help.
- All charging is done real-time with real-time rating. This directly supports Advice of Charge and, with user confirmation capabilities for non-repudiation and for indicating change of charging status (e.g. browsing to a premium rate site), this approach addresses some of the more common complaints about transparency of charging.
- All charging is done in real-time against a real-time balance. This occurs for both subscribers and commercial partners and hence enables an unprecedented degree of credit control.

## **Selling proposition around Partial Configurations**

TBD - This section will address the upsell propositions based around legacy components and one or more Nortel component. This will also address market variations such as operators that are focused on providing wireless access and partner with an ISP for advanced services (perhaps more typical in the North American market).

# Product Roadmap

Current Nortel products do not provide this complete solution today but sufficient functionality will exist by mid-year 2002 to provide a first offering of this vision. Timing of full deployment currently is linked to UMTS release 5, which is expected to become available in late 2003 and which is the subject of standards discussion today.

This section presents the near term roll-out plans of the key components with a view of what aspects of the vision are offered and where the key limitations lie. It also identifies the additional features required to fully address the solution for the consideration of the individual product PLM.

## GGSN

### POR

Destination Billing initial feature is committed for UMTS 02 (April 02). This feature is of limited granularity by comparison to the required solution.

### Architectural Fit

Initially, this supports downstream traffic only, has only normal or zero-rated prepaid support and only has 5 postpaid charging rates. As a consequence, the UMTS02 solution cannot support charging usage to the commercial partner (per shared, premium or sponsored sites) except for a small number of sites accessed by postpaid users. In addition, the downstream only restriction means that any download will generate some (albeit small) charge for the upstream control traffic (acks etc) necessary to manage the download. This causes some issue around how to express this capability to the end user since "free download" is not strictly true.

### Features required:

1. Multiple prepaid rates. This could be provided via maintaining multiple charging buckets each with its own coupon. In order to allow these to be rated by UP, CTP needs to be extended to carry the additional data upon which the rate is calculated e.g. destination/rule, SGSN IP address, current QoS, and so forth. Passing the destination/rule allows the appropriate commercial partner to be debited/credited as appropriate. The GGSN will need to be able to maintain multiple coupons per session but this can be a fixed small number (est. 3-10) with the counters recycled on a least recently used basis. Further

analysis of usage patterns is needed here to determine the optimum value.

2. Upstream traffic must be charged.

An interim and perhaps easy solution for passing on charges/revenue to the service provider for postpaid customers would be to extend the granularity to allow for specific counts to be allocated to individual service providers.. Again there is no requirement for all users to accumulate more than a few counts concurrently. I recommend that the destination filters are numbered and the filter number matched also be passed on the CDR with a CDR for each filter since then a new site with commercial terms can be represented by a rule.

## **Wireless Unified Payment**

The current Plan Views of rollout for WUP suggests that Mar 2002 is the first feasible incarnation of this architecture.

### **UP 1.0 Mar 02 --- Plan View**

WIR6.1 feature set, CS-1R, CAMEL I/II access, ANSI-41p (Nortel proprietary) access, WPP migrations. Capacity: 1200 cps, 8.5M active subs, 4.0M inactive

### **UP 2.0 Sep 03 --- Plan View**

New Acct Structure, mCommerce enablers, CAMEL III Data, New payment features, SB migrations for existing customers. Capacity: 1400 cps, 10.0M active subs, 5.0M inactive

## **Architectural Fit**

UP1.0 has sufficient capacity to support early installations of GPRS, m-Commerce and UMTS with correspondingly limited subscriber numbers and transaction volumes. This will continue to scale doubling capacity again by Mar 2003. However, this proposal will increase the workload on UP through adding more complex rating and probably increasing the number of transactions per second through the use of individual coupons per separately rated destination. The addition of accounts for commercial partners will also modify the workload and hence the capacity and scaling proposals need to be reconsidered in this light.

WUP (in both UP1.0 and UP2.0) does not offer an external rating function which can be used to rate application level events, and hence events must be rated elsewhere – initially by the application which is fine for on-line storefront applications. However, this limits the promotional incentives that can be



offered to postpaid users or vouchers for airtime offered via the storefronts. Since such incentives may be key to kickstarting 3G launch and boosting GPRS take-up in the interim, this is an area that should be considered a high priority.

UP 2.0 adds support for CAMEL III data triggers in support of roaming. The only MCommerce enabler function of use in this architecture is interface to the payment gateway for recharge and settlement activities. All other MCommerce functions will be addressed by the MCommerce enabler. Such features will be of value only when the WUP is deployed without the MCommerce enabler. The new account structure capabilities are fundamental to offering multi-user accounts (for families) and combined personal/business charging. However, significant incremental development is needed to support multi-party split bills for revenue and cost sharing.

## **Features required**

1. API to a rating engine function for NGS and MCommerce to exploit. This API needs work to define and should include more complex rating data, multi-party charging plus considerations of optimizations such as "rate and reserve".
2. Extensions to CTP to support enhancements to GGSN Destination billing feature.
3. Evolution of CTP to a more generic Charging API to allow for balance request, rating, reservation, confirmation, debit/credit, location and/or zone information, application, provider and content ID, etc.
4. Rating engine upgrades to support more complex billing scenarios and multi-party billing. Additional input data should include location (possible via dynamic request), SGSN IP (for roaming), historical information, merchant
5. Support for SMS Prepaid (MO and MT) e.g. CAMEL III SMS triggers should be supported (may be already covered by CAMEL III Data plans). SMSC vendors may also start to offer solutions, which should be reviewed.

# **NGS**

## **POR/I**

This section deals only with the NGS features of relevance to this document. NGS has many other features and functions in addition to those listed below.

### **NGS Rel 1.1 – November 2001**

First release includes Framework, Notification and Charging SCF, Adaptors for CTP to ServiceBuilder pre-paid, CDR generation for postpaid and SMPP to Logica SMSC.

### **NGS Rel 1.2 – Feb – March 2002**

Incremental adaptors to payment and SMPP adaptor validated with other vendors.

### **NGS Rel 2.1 – June 2002**

Camel call control and User Interaction SCFs added.

Note that these releases are FCS dates. In fact NGS GA July 2002

## **Architectural Fit**

In terms of functionality, NGS primary role is to arbitrate third party access to network capabilities and to arbitrate charging requests. NGS 1.1 contains the key outward facing features being the Charging SCF. Initially this will integrate direct to ServiceBuilder prepaid (and hence WUP) or generate CDRs for postpaid. To enable this architecture the adaptor for the MCommerce platform (Payment adaptor) is required which is scheduled for 1.2. Camel and User interaction support will potentially facilitate additional charging capabilities in terms of non-repudiation, advice of charge and general charging related user interactions.

Since the first GA version of NGS is scheduled for July 02, this may be the first availability for this architectural vision, but it is worth Noting that NGS 1.2 would be an adequate platform.

## **Features required**

1. Charging SCF should evolve to a more generic event based charging model with one event parameter being the value ascribed to the event by the merchant.

2. SMPP SCF. This should not be confused with the SMPP adaptor supported in NGS 1.1. The SMPP adaptor allows NGS to send SMS messages, whereas the SMPP SCF would allow applications or network elements to interact with NGS as if it were an SMSC allowing it to add charging functions for MO, and MT SMS before passing the actual SMS via the SMPP adaptor to the real SMSC. This would allow the NGS to arbitrate all SMS billing be it bulk, MO or MT. Currently this function is provided by RedKnee but this positions a competitor to Nortel's eMLC and NGS and is commercial unattractive. Most of the functionality to support this capability is in the NGS PoR via the SMSC adaptor. CAMEL 3 triggers are expected to be supported directly by WUP.

SMSCs are also starting to offer functionality to support prepaid SMS and generally speaking WUP is the most obvious place to support such triggers. An NGS SCF supporting SMPP would allow NGS to support existing SMSCs and to potentially provide some support for EMS should this gain market position, however this may only offer a small short term and further justification may be required to ensure alignment with SMSC partners. One advantage of the NGS SMPP SCF would be to ensure that SMS charging aspects of the solution would be largely interoperable with legacy SMSC installations and not be limited to Nortel partners or specific prepaid functions of SMSCs.

## **MCommerce**

### **POR**

MCommerce 2.0 due end June 02 is the first substantive release which would be suitable for this architecture.

Features include: Event based charging for applications, Single wallet for a single user, M-credit, Split payment transactions, Micro payment support, Merchant & user self care, OSA programmability access, CTP to Prepaid and Payment gateway and Security

Capacity: 0.5M subs at 40 TPS.

### **Architectural Fit**

Details to be reviewed with the m-Commerce team.

M-Commerce 2.0 provides most of the required functionality. The feature set is still stabilizing at time of writing and some detailed work on how best to configure MCommerce especially split of functionality between business rules and rating. This proposal unifies all accounts held by the operator in the

Accounts DB within the WUP product. This includes merchant accounts and the impact of this on MCommerce architecture needs to be reviewed.

**Features Required** (to be confirmed)

1. Use of external Rating engine via API as agreed with WUP
2. Support of enhanced SCF per NGS requirement i.e for non-rated events
3. Increased capacity

## **Alteon/Shasta IP Sniffing**

No current plans in place for this function.

The goal of this would be to provide more complex, access independent functionality to count and charge for data packets on the network. The GGSN solution is inherently limited by capacity trade-offs (charging resources vs processing resources and capacity in its main function as a GGSN) and is not on the data path for wireline packets. A number of our competitors (notably Cisco and Comverse) offer such functionality in varying forms, but it is not clear how much value add such a component offers and we are seeking further feedback from the market place on the relative merits of a simpler GGSN based solution vs the separate box solution. Another reason for this capability might be if SGSN based charging per the CAMEL model dominates the market. Further analysis for the business case for such a component is required.

## **Other**

This architecture would need to ensure adequate exemplars at the application level. In particular the interfacing with Portals and especially storefronts is above NGS and assumed to use Charging SCF, but this needs further analysis. The provision of exemplar/demo apps would enhance the pre-sales interactions, facilitate customer understanding, build customer and third party ability to develop applications and seed the space by providing some quick wins, which the customer could customize and deploy.

Nortel should investigate further the positioning of Periphonics Voice Portal as well as one or more web/wap portals.

Some many OAM&P and Customer self-service functions are best implemented as applications in this model notably account query and recharge. In particular, IVR is well suited to ensuring that these functions are ubiquitously and conveniently available. Nortel should provide vanilla

applications in this domain via Periphonics and perhaps GGSN Personal Network Portal /Captive Portal solutions.

## Standards Activities

### 3GPP OSA/Parlay/JAIN

NGS implements the OSA architecture. The OSA architecture draws heavily on the Parlay work and will continue to do so going forward. It therefore seems appropriate that we ensure that the Nortel strategy broadly aligns with the OSA/Parlay directions at least at a marketing level and it is appropriate that we start with the Parlay reference architecture.

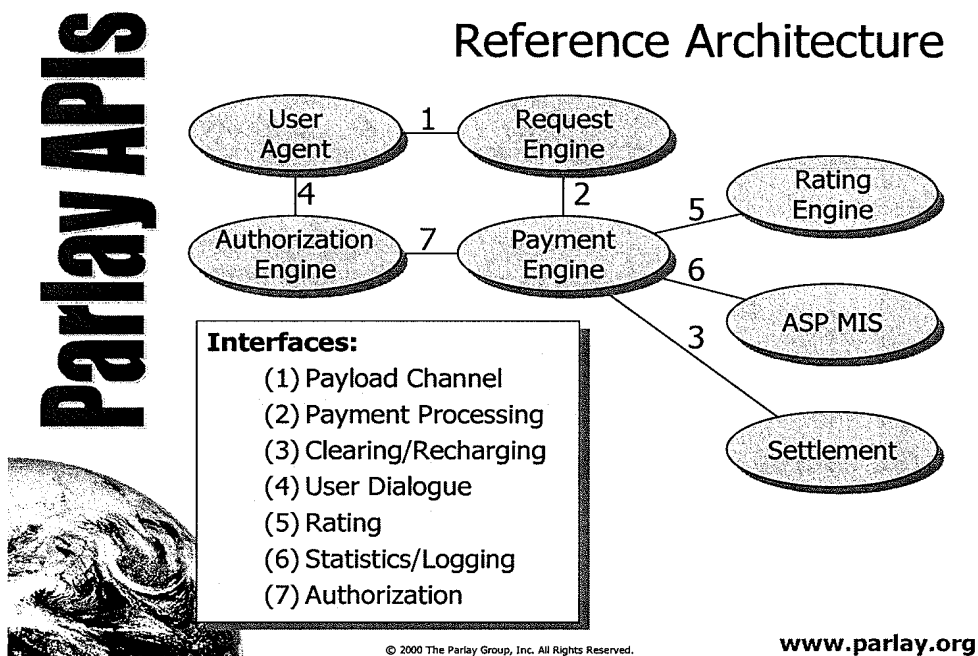


Figure 2: Parlay reference architecture

Mapping to this model, User Agent and Request Agent are in the application domain and outside Nortel's current scope. At least some aspects of authorization may reside in the Portal, again not within Nortel scope, but we need to further analyse this function. NGS provides the APIs which will deliver Interface 2. The implementation of that function must be covered between mCommerce, SB/UP and a postpaid billing system fronted by a CGF

(possibly Preside) if the operator requires it. MCommerce provides some settlement facilities although again this is addressed within the prepaid domain by SB/UP. SB/UP performs rating for prepaid and initial assumptions are that the application will rate e-commerce transactions.

### **3GPP IMS**

TBD

### **3GPP CAMEL**

TBD

<others?>

# **EXHIBIT D**

D:\Profiles\tim1\My Documents\Billing

File Edit View Favorites Tools Help

Back Search Folders

Address D:\Profiles\tim1\My Documents\Billing Go

Name	Size	Type	Date Modified
Wireless_SB.pdf	61 KB	Adobe Acrobat Doc...	23/10/2001 13:14
PrepaidServices.pdf	51 KB	Adobe Acrobat Doc...	25/10/2001 15:59
3G payment architectures.TR.doc	113 KB	Microsoft Word Doc...	31/10/2001 14:07
UP_WhitePaper_v1.1.doc	2,275 KB	Microsoft Word Doc...	06/11/2001 14:37
DestBilling-Highlights.ppt	299 KB	Microsoft PowerPoi...	08/11/2001 10:47
ChargingStrategy.v3.doc	737 KB	Microsoft Word Doc...	15/11/2001 15:32
UMTS On-line Charging Strategy 0.1.doc	3,957 KB	Microsoft Word Doc...	21/11/2001 11:40
UserValidation Issues.ppt	304 KB	Microsoft PowerPoi...	22/11/2001 16:12
ChargingCharts.ppt	1,089 KB	Microsoft PowerPoi...	30/11/2001 02:29
ChargingStrategySummary.ppt	309 KB	Microsoft PowerPoi...	05/12/2001 13:37
IEEPayArch v3.doc	103 KB	Microsoft Word Doc...	07/03/2002 08:31
BillingVisionforVF.ppt	732 KB	Microsoft PowerPoi...	18/03/2002 11:40
GPRS prepaidnode.zip	1,112 KB	WinZip File	03/04/2002 09:52
ChargingStrategyOverview2.0.ppt	730 KB	Microsoft PowerPoi...	03/04/2002 22:34
ChargingStrategyOverview2.0.zip	1,644 KB	WinZip File	16/10/2002 09:43
BillingVision.ppt	731 KB	Microsoft PowerPoi...	10/04/2003 12:27

53 objects 37.4 MB My Computer



# Exhibit E

**William Lee - RE: 3G 2002**

---

**From:** "Roberts, Tim [MOP:6858:EXCH]" <TIM1@nortel.com>  
**To:** <AMoore@iee.org.uk>  
**Date:** 1/11/2002 10:01:40 AM  
**Subject:** RE: 3G 2002  
**CC:** "Longman, Tim [MOP:6154:EXCH]" <tlongman@europem01.nt.com>

---

On behalf of Tim Longman and myself, please find attached a completed Confirmation form for our paper.

Thanks  
Tim Roberts  
Nortel Networks  
01279 402438

-----Original Message-----

From: Moore Andrew [<mailto:AMoore@iee.org.uk>]  
Sent: 08 January 2002 11:14  
To: Longman, Tim [MOP:6154:EXCH]  
Subject: 3G 2002

Dear Mr Longman

Third International Conference on  
3G 2002 Mobile Communication Technologies  
Wednesday 8 May - Friday 10 May 2002, Savoy Place, London, UK

The Organising Committee has now considered your abstract " " and asks that you be kind enough to prepare a full paper for presentation at the Conference. The full paper will be subjected to a final review, following which you will be informed of the final assessment result.

Please find attached the relevant documentation that will enable you to complete your paper which will be included in the Conference Proceedings. For all correspondence regarding your paper, your paper has been allocated a number: 90

The Confirmation Form should be returned to the 3G 2002 Secretariat as soon as possible either by fax or email. We will require your full paper to be submitted no later than the 8th February 2002 along with the attached Copyright form.

Please note that a presenting author will be expected to register for the Conference.

Should you require any further information please do not hesitate to contact either myself or Hannah Gill.

Best regards

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# Exhibit F

**Nortel Networks Confidential & Privileged Information**

**Disclosure Info**

<b>Disc No:</b>	15184ID	<b>Received Date:</b>	07 feb 2002	<b>Budget Year:</b>	
<b>Disclosure Title:</b>	System for Real-Time Charging in Wireless Networks				

**----- Inventors -----**

<b>Global Id</b>	<b>Name</b>
3202975	ROBERTS, TIMOTHY

# Nortel Networks Confidential & Privileged Information

<b>Disc Status:</b>	Disclosure Filed		<b>Status Date:</b>	08 feb 2002	
<b>LOB:</b>	WIRELESS NETWORKS		<b>Business Unit:</b>	WIRELESS SERVICE NETWORKING	
<b>Historical LOB1:</b>			<b>Historical BU1:</b>		
<b>Historical LOB2:</b>			<b>Historical BU2:</b>		
<b>Agt / Attny:</b>	TIEGERMAN, BERNARD		<b>Admin:</b>	ORLANDO, CHRISTINE	
<b>Vice President:</b>	LOWTHER, DOUG		<b>File Location:</b>	RICHARDSON	
<b>OS Firm:</b>			<b>Reviewing Unit:</b>		
<b>Project #:</b>		<b>Originating Dept:</b>		<b>Bell Funded %:</b>	
<b>Review Decision:</b>	Approved - In-House		<b>Review Date:</b>	09 apr 2002	
<b>Tech Field:</b>			<b>Hold Date:</b>		
<b>Tech Thrust:</b>		<b>Inventiveness:</b>		<b>Commercial Import:</b>	
<b>Priority Factor:</b>					
<b>Comments:</b>					
<b>NUB:</b>	[Inventor NUB]The system proposes a way to coordinate billing data in rea-time so that the operator can provide for a number of basibilling scenarios which involve correlating standard usage based billing techniques (volume and duration) with e-commece purchases and event based billing. Customer billing for on-line purchase of goods or servicess determined from packet addresses and rating tables whichetermine debits for customers and credits for providers ofhoes goods or services. Billing is applied to customer prepid or postpaid accounts thus avoiding the need for credit crd transactions. The system is controlled by a real time rting engine which sees all transactions.				
<b>Keywords:</b>	Real-time, Billing, Charging, Content-based billing, Fraud management, Unified payment, e-Commerce, m-Commerce, OSA, Prepaid, Postpaid		<b>Products:</b>		
<b>Licensee:</b>					
<b>FF Decision:</b>	No Foreign Filing		<b>Conception Date:</b>		
<b>Contract:</b>					

# Exhibit G





1/11/01 H-commerce workshop debrief.

Kevin H-P, Frank Travis Howard Forest, Greg Birdell, Luc Boucher, Brandon K Lammert  
(210 participants)  
Mark Thompson (airline) Kattarung.

App someplace else potentially

App vs enables vs payments

separation is required to indicate  
capabilities vs usage.

Outgoing from

Kevin H-P looking for Bob Todd to push stuff to  
CRM data system certain reference data which is propagated to all  
elements as required.

Outgoing SOA over the airway...

↳ building Partner Inputted → device - claimed its Audex.

No NGS touchpoints

Early 2002 12K users 200K per TC 2002.

NIS numbers debate ⇒ NGS is fully utilized

looking for more info on creating.

Midlevel positioning : 1ETF vs 3GPP

- phone discussion with Bob & Todd. gained traction with Todd

which looking for project strategies.

New reproduction concern. } Luc giving better understanding of alllet  
Session management app.

forming partnership with Mobilshare as preferred partner

↳ partnership also pursuing Sun/Planet to work with H-P.

2/11/01 OSA Charging Mtds.

Key: ? NGS recharge SCF

? NGS limits for how much can be charged (per app).

IMS Charging strategy

Aras Dec. 2001  
James Beaudry

5/11/01 Robert Bell.

Steve Radnie → works to our solution.

Paul Givney / Dugheim

Bill Barnes / Michael Campbell / Robert Beaudry  
Power Business

Jim Bourne / James Brown runs of R&D program.

Business Strategy after lunch.

7/11/01 Converse presentation.

Converse: Jim, Etgen Wallace.

Model: Ross, Tim + audio (Thomas, Bryant Fung).

Etgen: Product Manager, Skippers - the Portal.

Skippers:

launched first cut in Australia (Orange)  
- now developing next gen - multi-access portal

Multi-access → explicit enabled and base all of whom have access to  
vice

→ want to get into the portal for old services to internet.

Emphasis: unity movement of subscribers

Converse Open SMS - SMS as a service for a service provider retaining state

Shipper: marginalize content providers

by aggregator based on semantics of stream

⇒ app hence value renders a generator.

⇒ save form of autonomy.

⇒ privacy system is more uniform

→ Fast minute opportunities via follow on options.

→ eg. virtual has a "press wire for up"

→ or push slide price with button for up via open.

Device format is via equipment id (device id dynamically)

→ unique to converse

Device Detection for "Feature"

→ ready for YE.

Mobile P2P marketplace is not particularly consistent.

VML → could benefit from voice loc

→ need to substitute P2P within is another add

→ good add. for P2P or if future there is an existing P2P bank.

Mobile P2P is extension of GWS, so can always have a reason. (eg. Fast door)

Site based billing analysis

Hotel extends concept to leverage WAP GWS pricing | adding / D/S however P2P becomes the core of universe.

Shipper: All set is merging into OSA GWS concepts  
→ save impact for user privacy → ? granularity

Content Peeling is ACE concept for stripping data from web pages.

RTDB = real time data billing S/P

→ evolution of our technology but interface

B2C directed Converse to work with company or prepaid

usage billing.

→ need to go back to ST re GWSN organization

→ every Mobile Store

→ also Allcom + SB

Cost: <sup>Ans</sup> Orange (as bank), Dixie (10%, ITS), ISM (Tide), KKTZ (Cyprus)

→ send small bills

PDA support for end P1.

Ph: value of Shipper to Notal sales?

→ more on location soft.

JP pitched Shipper to collect a year ago.

→ competitive to B2C A/S Secs

NCS material - started with Good etc.

- primary solutions in Wireless
- looking for wireless opportunities

? meaningful NCS ops?

→ what is NCS pure view of target.

? engagement with ST [redacted] Wholesale app with BT Exact.

→ have issued RFQ for clearinghouse app.

4 vague staff.

And NCS APP, NCS App collocated on single box.

Goal for Thursday is to take a view on whether there is mutual benefit to take things forward and if so to articulate how.



ESN 540 1393 PC 7422438 Chair: 3711  
744 1628 711393

AC13 MOP 5.

28/11/01 HOFU response.

Mikhail, Andrey : SmartTruck.  
746 7026 99326 Phil condense: 724  
John Dwyer,

3.3.1. Q.E update text.

3.3.2.B "Directly interfaced" → updated

independence of SMC.

- bring out WIS NCS custom development.

"Wireless Banking Gateway"

Revised Payment Application text to send 724 to produce a simple

app for Mubtifa to enhance.

Rebafu W from meeting.

Dellin, Tim,

→ as agreed.

→ need agreed but it is an issue.

30/11/01.

Team meeting.

Todd, Luis, Mike, Thomas, Bill, Bob, Tim,

- 1) Work items for partner program
  - ∴ program overloaded; Todd's team module
  - ∴ items of priority for BT delivered early on time
  - ∴ ongoing
  - ∴ items supplied
  - ∴ no real follow-up.

2) Work items for RKO team

→ who owns ref Arch? System or RKO, disagreement is noted (order number 100) but no decision.

→ Jeff mid next week in Ottawa + following weeks  
charts to be circulated.  
→ RKO + SMC, resp + operating plan etc.

3) Ding staff meeting: review partner strategies

operating plan

• RKO + SMC

• arch

eMHC → proposal to support KCT. (business case)

NGS → simulation for 1x market.

reduction in WSN no finalised.

Elizabeth Gonzalez → A+S Business Development  
 ↳ Nicky  
 Carlos Bani.

VF: 9:30 @ Henderson meeting afternoon:

12/01  
 BT prep. NGS status.  
 Greg Leavins

VF meeting: present NGS offer to Herbology.  
 technical power. moving to Russell's.  
 but CSA gms seems to be the coming virus (don't know how great).  
 praise for X44 (SAR) never highlighted in Standards.

Action: document voice version of M-Rugment app.  
 as check pack.

Action: articulate  
 12/6/01 Charging Ardu  
 Patricia, Luc, Dan Devenney, Tim Longman, Michael Campbell.  
 Tim.

Rodney → applications  
 ↳ record explicit reductions. < exclusions  
 many are applications.

Oliver → Accounts Why balance + information  
 ↳ separation of wallet | Account e.g. shipping address

Spir billing vs multi-related billing

? scope of job  
 ↳ need a portfolio wide strategy  
 ↳ in support of the business



1-2 hr 3:00  
 T-MO mid Jan 16<sup>th</sup> / 17<sup>th</sup>  
 ↳ billing prime not there.

Outstanding QNs  
 Vision charts: Tim  
 timeline for implementation - review by product prime.

ban / Michael to resolve split billing  
 - get a view from Todd

7/12/01 Team meeting  
 Thomas, Tim, Bob, Bill, Luis, Ross, Todd. (links)

1) Todd going to Ottawa on Sunday for Day 1 PMT for a week & half.  
 then: team assessment, operating plan  
 week plan: Common Arch strategy 2002-2004  
 + partnerships  
 Plan: Partner program review  
 Tues: review of issues / summarizing results.

# EXHIBIT H

15/1/02. NA market requirements update.

Alain Roy, Laurie Barclay, Sita, Bob, Greg Barrett, Philippe [redacted] Eric D

NA: [redacted] early engagement - no detailed requirements yet.  
- workshops scheduled.

Local opportunities in 2002.

- solves business problem of complexity reqt.
- less concerned about strict standards compliance
- XML/SOAP web based philosophy is critical.  
→ Web Services also of interest.

Sprint not interested in using Charging API to change the application  
→ need to review implications of this.

Need story on how (how long) to get adapters built online.

Dynamics SP Server is a very complex [redacted] of all [redacted].  
External DB → we not using [redacted] on board DB.  
→ perf. implications.

15/1/02 Synch up for WWP/ISO/NGS.

Roy: Dan Davenney, Sita, Phil.

- Roy wants to know what's happening.
- Sim ? NA penetration of SB. Cincinnati Bell WWP/NGS relatively

SB NA view:

18/1/02.

NGS - Per exploration.  
Sita, Dan Davenney, Mike Leathers, Dave Tidwell, Mark Coleman.

Rendrup

islands of nodes ↔ unified resource under NGS.

VF: INK + Governance + OSA + Service Voice Portal  
→ selected by WSN  
→ Ben want to proceed - content to be negotiated with WSN

ST: Some dissent within VF } shed s.p. to specific things  
No progress with VF UK for VM.

Vigini - extensions to avoid.

Programming Paradigm

OSA vs WEB Voice  
SOAP Service Oriented, Security  
Voice XML limited → CEXML on top of Voice XML  
→ have no type focus.

AppSaves (WSP/Server)

WSP/MS [CEXML integrates]

query: possible IMS programme

indicator for caller  
trap in Web form  
→ user doesn't give access to resources.

VF: evaluating VXML

WSP/Server VXML complement HTML, while

Voice Portal  
S/W only

James Seaver's front end  
↳ provides call logs

ESB backbone (integration of APIs)

↳ hands off to JSP  
presents to a browser  
www, HTTP, VNC

IBM providing infrastructure

Option 1: PenProbes based app creation

VF additional functionality via single API across multiple vendors  
VoIP, SIP - a long way out. ~~AT&T~~

Guidelines: VF: Location: CPS. ? JSP

Hardware: e-Wallet of Bobcat.

Action: TK.

- share NGS PoR / PoI with ~~disposition~~ team.

- create/prioritize VF activities in PoR.

- ensure ~~disposition~~ team for new adaptations.

- Server deployed in Call Center with network perimeter ch

Option

Make to produce - self pitch.

23/1/02

Mobile internal prep meeting.  
Jim, Eric, Delling, Sam, Joe Allen, Chris Coffey,

Sam - no feedback from customers.

Spec comments. question sent to meeting. (RFP ~~project~~ is lead estimate - compare)

Bob happy with SmartTrust:

Mobile have a high level of independence from VF Corporate:

→ probably not nice Bobcat: likely be asked afterwards.

Sam: need to ~~penetration~~

PenProbes, WAP, synchronization - after all we  
issues: local support - proposal which is browser only but does  
applications development

DOT as DT + possible app developers - not an issue.

↳ need to show flexibility around S&A app partners

So approx 1/2 day

1 1/2 - 2 hr presentation + Q&A.

Sam proposed agenda,

? Eric has business models.

Technical audience: good English speakers.

Delivery failures have been a problem - need from PoR  
w/ get to deliver  
+ cost of dead links due to lack of funds.

Article NGS activity: Engleth Gorgelag. find out if we can share this.

→ John needs to prepare on SI/plan - how long, what would happen we  
to do.

Revised agenda (end of tomorrow).

Have a call on Friday including partner

Audio & 3-part.

LHR 12.15 Monday

Questions and issues for Tech.

- 1) Reorg.
- 2) Status of SS, MComms, Prepaid/terminals
- 3) ~~Prepaid~~ activities: 1) MComms inc. how solid is MComms P&L.
  - ii) H3G LPI
  - iii) IEE paper
  - iv) Ormrod
  - v) NCS - P&L integration - true or not?
- 4) Personal station: source & critical skills?  
career opportunities - express interest in working into MComms Technology.

6/2/02 P&L technical walkthrough

Tim, Mark Coleman.

INTERVIEW "RFC 2020 with" <sup>IN SINCE</sup> ~~the~~ <sup>releases</sup> ~~for~~ <sup>for</sup> SIP networks.  
DRAFT

Visay K. Gurbani  
→ Keith Davies → Ahmed Rana → Thomas Griesner

? Chris Woods

Global Business & P&L markets.  
"Global Network Service Gateway"

i) SMS gateway

ii) location based service gateway

"MILES" <sup>location system</sup>

"LES" in Germany

→ 90 days plan.

1) Camel P4. ? context based billing

2) Prepaid user - everything. (CRM stuff)

Actions: STAFF client Transceiver - present to Mike Lecker.

14/2/02 Orange prepaid data billing.

Richard Bostin, John Wilson, Eric, Tim.

6  
Jean Michel Legros, GPRS Product Mktg.

John's objectives: i) GPRS prepaid billing (GPRS with the table)

14/2/02 VF billing, P&S, Apps stuff - P&S, Eric.

Meeting on 13<sup>th</sup> with VFUK - aim with GGSN business 4-6 week window.  
Context based billing raised much discussion.  
→ looking to create a process to walk through the decisions plus value proposition for Intel & other suppliers.

Need to

21/2/02 VF Report: Chris Wood, Stewart.

74 days remaining of plan.  
→ to 10 x platform!

GSM: Global Networks Services - focus on third party developers  
- not specifically voice focused.  
- while 3. Service lifecycle support infrastructure defining  
→ operations develop ("progress")